

HS-4010

Half 486 Little Board

10 Base-T Network, Flat Panel, VGA Control.

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Chapter-1

General Information

The HS-4010 is an all-in-one half size industrial single board with design in Novell NE2000 compatible 16 bits ISA bus Ethernet, provides 10 BASE-T for directly network automation demand.

Supports for various 40-133 MHz 80486SX/DX/DX2/DX4, 5x86 CPUs with 32-bit data bus and processing ability. Up to 64MB RAM by 72-pin SIMM supported. Provides "DiskOnChip? " socket supported memory size up to 72 MB.

Desinged with the on board 1MB memory VGA architecture, supports direct interface to color and monochrome Single Drive (SD) and Dual Drive (DD) STN, TFT & EL panels and resolutions up to 1024x768 256 colors to CRT monitor.

The HS-4010 support completed with all necessary I/O for industrial application. Two PCI enhanced IDE ATA-2 IDE drivers; supports up to two floppy disk drivers; provide two high speed serial RS-232 ports port with compatible to 16C550 UART with 16-byte FIFO; one enhanced bi-directional parallel port which support SPP/EPP/ECP. The board also provides keyboard and PS/2 mouse connector.

1.1 Major Features

- ✂✂ 80486SX/DX/DX2/DX4, 5x86 CPU supported.
- ✂✂ ALi 1487/1489 chipset.
- ✂✂ Supports DRAM up to 64 MB.
- ✂✂ Fast PCI enhanced IDE controller supports two IDE drives.
- ✂✂ Two high-speed serial RS-232 ports (supports 16C550 UART with 16-byte FIFO).
- ✂✂ One enhanced bi-directional parallel port supports SPP/EPP/ECP.
- ✂✂ Keyboard and PS/2 Mouse connector.
- ✂✂ On-board SMSC 37C669 Super I/O.
- ✂✂ On-board 32 bit PCI-BUS VGA/ Panel controller.
- ✂✂ "DiskOnChip™" Socket Supported Memory Size up to 72 MB.
- ✂✂ On-board 16 bit ISA bus Ethernet, Novell NE2000 compatible.

1.2 Specifications

- ✂✂ **CPU:** 80486SX/DX/DX2/DX4/5X86.
- ✂✂ **Bus interface:** ISA bus
- ✂✂ **Chipset:** ALi 1487/1489
- ✂✂ **Data bus:** 32-bit
- ✂✂ **Processing ability:** 32-bit
- ✂✂ **PCI Flat Panel / VGA Controller:** VGA Chipset with 1 MB memory interface to color and monochrome Single Drive (SS) and Dual Drive (DD) STN, TFT & EL panels. Support CRT resolutions up to 1024x768 256 colors.
- ✂✂ **PCI Enhanced IDE interfaces:** Supports up to two enhanced IDE ATA-2).
- ✂✂ **RAM memory:** Up to 64MB, uses two 72-pin SIMM sockets.
- ✂✂ **Cache memory:** On board 128KB 2nd level cache.
- ✂✂ **Floppy disk drive interface:** Supports up to two floppy disk drives.
- ✂✂ **Parallel port:** One parallel port supports SPP/ECP/EPP.
- ✂✂ **Serial port:** Two RS-232 ports supports 16C550 UART with 16-byte FIFO.
- ✂✂ **BIOS:** AWARD flash BIOS.
- ✂✂ **Watchdog timer:** Hardware circuit can be set by 1, 2, 10, 20, 110, or 220 seconds period Reset or NMI was generated when CPU did not periodically trigger the timer.
- ✂✂ **Ethernet:** Realtek RTL8019, 16 bit ISA bus Ethernet, Novell NE2000 compatible.
- ✂✂ **Keyboard / Mouse connector:** 8-pin connector supports standard PC/AT keyboard and a PS/2 mouse.
- ✂✂ **ISA bus:** Standard ISA bus
- ✂✂ **Flash memory Disk:** Reserved socket for "DiskOnChip™",

support up to 72MB Flash memory disk.

-
- ✂ ✂ **CMOS:** Real-time clock/calendar and battery backup by DS12B887 or equivalent device.
 - ✂ ✂ **Power supply voltage:** $\pm 5V \pm 5\%$, $\pm 2V \pm 5\%$.
 - ✂ ✂ **Max. Power requirement:** +5V @2.5A
 - ✂ ✂ **Operating temperature:** 0-55°C (CPU need cooler).
 - ✂ ✂ **Board size:** 8" (L) x 5.75" (W) (203mm x 146mm).

1.3 Delivery Package

The delivery package of HS-4010 includes all following items:

- ## HS-4010 Industrial Single Board
- ## Printer port Flat Cable
- ## IDE port Flat Cable
- ## FDD port Flat Cable
- ## Serial port Cable
- ## PS/2 Mouse and Keyboard Transfer Cable
- ## Utility Diskette
- ## User' s Manual

Please contact with your dealer if any of these items are missing or damaged when purchasing. And please keep all parts of the delivery package with packing materials in case of you want to ship or store the product in feature.

Chapter-2

Hardware Installation

This chapter provides the information on how to install the hardware of HS-4010. At first, please follow up sections 1.3, 2.1 and 2.2 in check the delivery package and carefully unpacking. Following after, the jumpers setting of switch, watchdog timer, and the DiskOnChip? address selection.

2.1 Caution of Static Electricity

The HS-4010 has been well package with a anti-static bag in protect its sensitive computer components and circuitry from the damage of static electric discharge.

Note: DO NOT TOUCH THE BOARD OR ANY OTHER SENSITIVE COMPONENTS WITHOUT ALL NECESSARY ANTI-STATIC PROTECTION.

You should follow the steps as following to protect the board in against the static electric discharge whenever you handle the board:

1. Please use a grounding wrist strap on whoever needs to handle the HS-4010. Well clip the ALLIGATOR clip of the strap to the end of the shielded wire lead from a grounded object. Please put on and connect the strap before handle the HS-4010 for harmlessly discharge any static electricity through the strap.
2. Please use anti-static pad for put any components or parts or tools on the pad whenever you work on them outside the computer. You may also in use the anti-static bag instead the

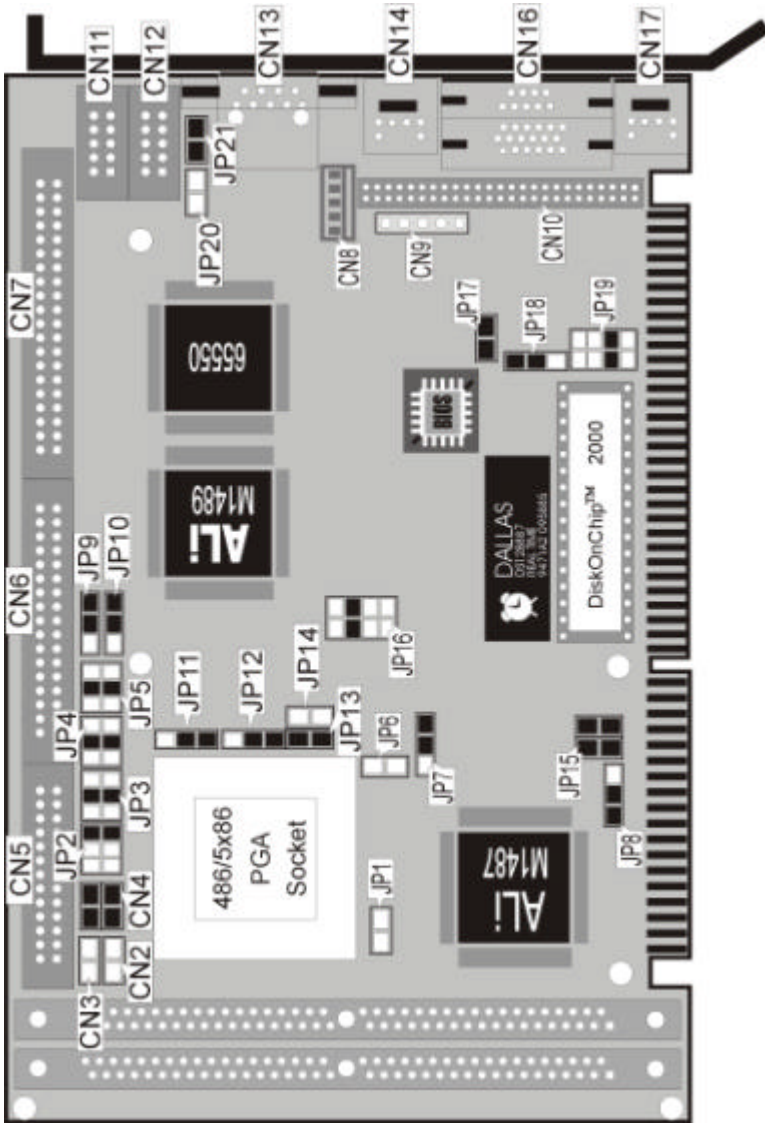
pad. Please ask from your local supplier in help up your necessary parts on anti-static requirement.

2.2 Caution on Unpacking and Before Installation

First of all, please follow the all necessary steps of section 2.1 in order to protection the HS-4010 from electricity discharge. With refer to section 1.3, please check the delivery package again with following steps:

1. Unpacking the HS-4010, keep well storage of all packing material, manual and diskette etc. if has.
2. Is there any components lose or drop from the board? DO NOT INSTALL IF HAPPENED.
3. Is there any visual damaged of the board? DO NOT INSTALL IF HAPPENED.
4. Well check from your optional parts (i.e. CPU, SRAM, DRAM, ROM-Disk etc.) for completed setting all necessary jumpers setting to jumper pin-set and CMOS setup correctly. Please also reference to all information of jumpers setting in this manual.
5. Well check from your external devices (i.e. Add-On-Card, Driver Type etc.) for completed add-in or connection and CMOS setup correctly. Please also reference to all information of connector connection in this manual.
6. Please keep all necessary manual and diskette in a good condition for your necessary re-installation if you change your Operating System or whatever needs.

2.3 HS-4010's Layout



2.4 Quick Listing of Jumpers

JP2, 3, 4, 5, 9,10,11,12,13	—	for CPU type setting
JP1	—	CPU clock selection
JP6	—	CPU's Vcore voltage level selection setting
JP7	—	CPU's operating voltage selection setting
JP8	—	PCI clock setting
JP14	—	for AMD CPU type selection
JP15	—	CPU Clock-in selection
JP16	—	WATCH-DOG Time-out period selection
JP17	—	PS/2 Mouse IRQ selection
JP18	—	WATCH-DOG Active selection
JP19	—	for DiskOnChip™ address setting
JP21	—	LAN jumpless selection setting
JP26	—	LAN plug in play selection setting

2.5 Quick Listing of Connectors

CN2:	RESET
CN3:	SPEAKER
CN4:	IDE LED CONNECTOR
CN5:	HARDDISK CONNECTOR
CN6:	FLOPPY DISK CONNECTOR
CN7:	PARALLEL PORT
CN8:	KEYBOARD CONNECTOR (HEADER 6 PIN)
CN9:	POWER LED/ KEYLOCK
CN10:	FLAT PANEL PORT
CN11:	COM 1 (HEADER 5X2)
CN12:	COM 2 (HEADER 5X2)
CN13:	ETHERNET CONNECTOR
CN14:	MOUSE CONNECTOR
CN16:	VGA CONNECTOR

CN17: KEYBOARD CONNECTOR (MINI DIN TYPE)

2.6 Jumper Setting Description

A jumper pin-set is **ON** as a shorted circuit with a plastic cap inserted over two pins. A jumper pin-set is **OFF** as an open circuit with a plastic cap inserted over one or no pin(s) between pins. The below figure 2.2 shows the examples of different jumper pin-set setting as **ON** or **OFF** in this manual.

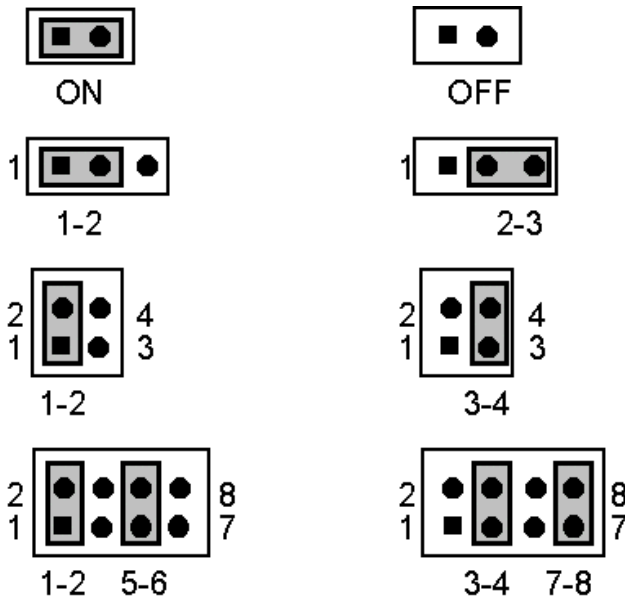


Figure 2.2

All jumper pin-set already has its default setting with the plastic cap inserted as **ON**, or without the plastic cap inserted as **OFF**. The default setting may reference in this manual with a " * " symbol in front of the selected item.

2.7 Setting the CPU of HS-4010

The HS-4010 provides all possibility in jumper setting for wide using all types of 486 series CPU with JP1, JP2, JP3, JP4, JP5, JP7, JP8, JP9 and JP10 setting as following:

2.7.1 CPU Clock Setting

CPU	JP2	JP3	JP5	JP4	JP9	JP1 0	JP1 1	JP1 2	JP1 3
1. IntelDX4™	OFF	3-4	3-4	3-4	2-3	2-3	1-2	OFF	ON
*2. Cyrix 5x86	5-6	3-4	3-4	3-4	2-3	2-3	2-3	2-3	ON
3. AMD DX4 + (SV8B)	5-6	3-4	3-4	3-4	2-3	2-3	2-3	2-3	ON
4. Cyrix/TI/SGS DX2/DX4	1-2	5-6	5-6	5-6	2-3	2-3	1-2	1-2	ON
5. AMD DX/DX4 (NV8T)	OFF	OFF	1-2	OFF	2-3	2-3	1-2	OFF	OFF
6. AMD DX2+ (SV8B)	1-3,5-6	3-4	3-4	3-4	2-3	2-3	2-3	2-3	ON
7. AM5x86 P75 (133MHz)	1-3,5-6	3-4	3-4	3-4	2-3	2-3	2-3	2-3	ON

Correspond to different type CPU, it is request to set JP6 and JP7 for match the CPU operating voltage. Here shows at below of the proper jumper settings for their respective Vcc.

2.7.2 CPU power supply select

JP6	DESCRIPTION
ON	5V
* OFF	3V

JP7	DESCRIPTION
1-2	3.45V
*2-3	3.3V

For AMD type CPU, please set correctly of JP14 as following. For others, please keep JP14 at **OFF** setting.

2.7.3 AMD CPU type select

JP14	DESCRIPTION
ON	AMD DX2
*OFF	AMD DX4

JP15 used to synchronize the CPU clock with the CPU type. Please set the CPU clock with JP15, JP1 and JP8 jumpers according to the base CPU speed.

2.6. **CPU clock select**

JP15	JP1	JP8	DESCRIPTION
OFF, OFF	OFF	1-2	25 MHz
*1-2, 3-4	OFF	1-2	33 MHz
OFF, 3-4	ON	2-3	40 MHz
1-2, OFF	ON	2-3	50 MHz

2.8 System Memory DRAM

The HS-4010 provides a wide range on-board DRAM memory sizes from 1 MB to 16 MB by using 1, 2, 4, 8 or 16MB 72-pin SIMMs (Single In-Line Memory Modules) with access time should be 70 n-second or faster.

The HS-4010 provides two banks for memory installation by SIMM RAM module on card. The banks are designated as Bank0 and Bank1. See the figure on section 2.3 for get the identifying the banks. You must use from Bank0 first if install one SIMM only. If you are using both banks, the memory capacity of both SIMMs should be the same.

2.9 Watch-Dog Timer

There are three access cycles of Watch-Dog Timer as Enable, Refresh and Disable. The Enable cycle should proceed by READ PORT 443H. The Disable cycle should proceed by READ PORT 043H. A continue Enable cycle after a first Enable cycle means Refresh.

Once if the Enable cycle activity, a Refresh cycle is request before the time-out period for restart counting the WDT Timer's period. Otherwise, it will assume that the program operation is abnormal when the time counting over the period preset of WDT Timer. A System Reset signal to start again or a NMI cycle to the CPU comes if over.

The JP18 is using for select the active function of watch-dog timer in disable the watch-dog timer, or presetting the watch-dog timer activity at the reset trigger, or presetting the watch-dog timer activity at the NMI trigger.

JP18 : Watch-Dog Active Type Setting

JP18	DESCRIPTION
*1-2	System Reset
2-3	Active NMI
OFF	disable Watch-dog timer

JP16 : WDT Time - Out Period

PERIOD	1-2	3-4	5-6	7-8
--------	-----	-----	-----	-----

*1 sec	OFF	OFF	ON	OFF
2 sec	OFF	OFF	ON	ON
10 sec	OFF	ON	OFF	OFF
20 sec	OFF	ON	OFF	ON
110 sec	ON	OFF	OFF	OFF
220 sec	ON	OFF	OFF	ON

The Watch-dog timer is disabled after the system Power-On. The watch-dog timer can be enabled by a Enable cycle with reading the control port (443H), a Refresh cycle with reading the control port (443H) and a Disable cycle by reading the Watch-dog timer disable control port (043H). After a Enable cycle of WDT, user must constantly proceed a Refresh cycle to WDT before its period setting comes ending of every 1, 2, 10, 20, 110 or 120 seconds. If the Refresh cycle does not active before WDT period cycle, the on board WDT architecture will issue a Reset or NMI cycle to the system.

The Watch-Dog Timer is controlled by two I/O ports.

443H	I/O Read	The Enable cycle.
443H	I/O Read	The Refresh cycle.
043H	I/O Read	The Disable cycle.

The following sample programs showing how to Enable, Disable and Refresh the Watch-dog timer:

```

WDT_EN_RF      EQU    0443H
WDT_DIS        EQU    0043H

WT_Enable      PUSH    AX                ; keep AX DX
                PUSH    DX
                MOV     DX,WDT_EN_RF    ; enable the watch-dog timer
                IN     AL,DX
                POP     DX                ; get back AX, DX
                POP     AX
                RET

WT_Rresh       PUSH    AX                ; keep AX, DX

```

	PUSH	DX	
	MOV	DX,WDT_ET_RF	; refresh the watch-dog timer
	IN	AL,DX	
	POP	DX	; get back AX, DX
	POP	AX	
	RET		
WT_DISABLE	PUSH	AX	
	PUSH	DX	
	MOV	DX,WDT_DIS	; disable the watch-dog timer
	IN	AL,DX	
	POP	DX	; get back AX, DX
	POP	AX	
	RET		

2.12 VGA Controller

The C&T 655xx family supports a wide variety of monochrome and color Single-Panel, Single-Drive (SS) and Dual-Panel, Dual Drive (DD) standard and high-res passive STN and active matrix TFT/MIN LCD, and EL panels. For monochrome panels, up to 64 gray scales are supported. Up to 4096 different colors can be displayed on passive STN LCDs and up to 16 M colors on 24-bit active matrix LCDs.

The HS-4010 uses C&T 65550 chipset. Provides 2.0 mm pitch 44-pin on-board internal connector for flat panel connection; and a external DB15 analogy R.G.B. output connector for CRT monitor. By BIOS setup, user may use one of the display devices or both. Please use at the same resolution when both display. Please contact with your dealer if connection to a new specification flat panel.

The HS-4010 offers a variety of programmable features to optimize display quality. Vertical centering and stretching are provided for handling modes with less than 480 lines on 480 - line panels. Horizontal and vertical stretching capabilities are also available for both text and graphics modes for optimal display of VGA text and graphics modes on 800x600 and 1024x768 panels.

2.13 DiskOnChip? Address Setting

The HS-4010 provides a U8 socket for install the DiskOnChip? module.

A JP19 may select the starting memory address of the DiskOnChip? (D.O.C.) for avoid the mapping area with any other memory devices. If you have another extra memory devices in the system with the same memory, neither the HS-4010 nor the extra memory devices will function normally. Please setting both at different memory address mapping.

2.2 **JP19 : DiskOnChip? Address**

PIN NO.	Address
*1-2	D000
3-4	D800
5-6	E000
7-8	E800

*) : default setting

The D.O.C. function allows the system in using without FDD nor HDD. The D.O.C. may formatting as driver C: or driver A:. User may also easily uses the DOS's commands such as FORMAT, SYS, COPY, XCOPY, DISCOPY and DISKCOMP etc. This is means that the D.O.C. may uses as driver-A if the system without FDD-A for ambient application. Please contact with your supplier for different size D.O.C. module.

Chapter-3

Connection

This chapter gives all necessary information of the peripheral's connections, switches and indicators.

3.1 The Floppy Disk Drive Connector

A standard 34-pin header daisy-chain driver connector provides as CN6 with following pin assignment. Total two FDD drivers may connect.

⚡ CN6 : FDD CONNECTOR

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GROUND	2	REDUCE WRITE
3	GROUND	4	N/C
5	GROUND	6	N/C
7	GROUND	8	INDEX#
9	GROUND	10	MOTOR ENABLE A#
11	GROUND	12	DRIVE SELECT B#
13	GROUND	14	DRIVE SELECT A#
15	GROUND	16	MOTOR ENABLE B#
17	GROUND	18	DIRECTION#
19	GROUND	20	STEP#
21	GROUND	22	WRITE DATA#
23	GROUND	24	WRITE DATA#
25	GROUND	26	TRACK 0#
27	GROUND	28	WRITE PROTECT#
29	GROUND	30	READ DATA#
31	GROUND	32	SIDE 1 SELECT
33	GROUND	34	DISK CHANGE#

3.2 PCI E-IDE Drive Connector

A standard 40-pin header daisy-chain driver connector provides as CN9 with following pin assignment. Total two IDE (Integrated Device Electronics) drivers may connect.

Table 3.2.1 CN5(IDE 1) : Primary IDE Connector

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RESET	2	GROUND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11
11	DATA 3	12	DATA 12
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14
17	DATA 0	18	DATA 15
19	GROUND	20	N/C
21	N/C	22	GROUND
23	IOW#	24	GROUND
25	IOR#	26	GROUND
27	N/C	28	BALE - DEFAULT
29	N/C	30	GROUND# -DEFAULT
31	INTERRUPT	32	IOCS16#-DEFAULT
33	SA1	34	N/C
35	SA0	36	SA2
37	HDC CS0	38	HDC CS1#
39	HDD ACTIVE	40	GROUND

3.3 Parallel Port Connector

A standard 26-pin flat cable driver connector provides as CN1 with following pin assignment for connection to parallel printer.

Table 3.3 **CN1 : Parallel Port Connector**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	STROBE	2	DATA 0
3	DATA 1	4	DATA 2
5	DATA 3	6	DATA 4
7	DATA 5	8	DATA 6
9	DATA 7	10	ACKNOWLEDGE
11	BUSY	12	PAPER EMPTY
13	PRINTER SELECT	14	AUTO FORM FEED
15	ERROR#	16	INITIALIZE
17	PRINTER SELECT LN#	18	GROUND
19	GROUND	20	GROUND
21	GROUND	22	GROUND
23	GROUND	24	GROUND
25	GROUND	26	GROUND

3.4 Serial Ports Connectors

The HS-4010's CN11 and 12 headers provides two high speeds NS16C550 compatible UARTs with Read/Receive 16 byte FIFO serial ports. Please see the following pin assignment. With the delivery package, user may use the 10-pin COM cable for plug into CN11 and 12 for get COM1 to COM2 connection. The pin number inside the () are for the 10-pin cable.

CN11, 12 : Serial Port 10-pin Headers (COM1~COM2)

COM Port	PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
COM 1 (CN11)	1(1)	DCD	2(2)	DSR
	3(3)	RXD	4(4)	RTX
	5(5)	TXD	6(6)	CTX
	7(7)	DTR	8(8)	RI
	9(9)	GND	10(10)	NC
COM 2 (CN 12)	1(1)	DCD	2(2)	DSR
	3(3)	RXD	4(4)	RTX
	5(5)	TXD	6(6)	CTX
	7(7)	DTR	8(8)	RI
	9(9)	GND	10(10)	NC

3.5 Keyboard Connector

The HS-4010 provides a 6-pin mini din connector CN17 for connection to Keyboard devices.

☞ **CN17 : 6-pin Mini Din Keyboard Connector**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	KB-DATA	2	NC
3	GND	4	VCC
5	KB-CLK	6	NC

3.6 Power's LED, FAN and Key-Lock Connectors

The CN9 provides both Power's LED and Key-Lock connector as following pin assignment.

☞ **CN9 : POWER LED & KEYLOCK**

PIN NO.	DESCRIPTION
1	POWER LED ANODE
2	KEY
3	GROUND
4	KEYLOCK
5	GROUND

3.7 Mouse Connector

The HS-4010 provides a 6-pin mini din connector CN14 for connection to Mouse devices.

☞ **CN14 : 6-pin Mini Din Keyboard Connector**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	MS-DATA	2	NC
3	GND	4	VCC
5	MS-CLK	6	NC

3.8 PS/2 Mouse IRQ12 Selection Connector

The HS-4010 has an on-board PS/2 mouse which using IRQ12. If you do not use the PS/2 mouse and wish to assign IRQ12 for other purposes, you should setting the JP17 to disconnect PS/2 interrupt from IRQ12.

JP17	SELECTION
OFF	No interrupt for PS/2
*ON	IRQ12

*) : default setting

3.9 VGA Connector

The HS-4010 has on-board 15-pin external VGA connector.

2.2. **CN16 : VGA Connector**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RED	2	GROUND
3	GREEN	4	GROUND
5	BLUE	6	GROUND
7	GROUND	8	GROUND
9	GROUND	10	GROUND
11	GROUND	12	SPCLK
13	HSYNC	14	VSYNC
15	SPD	16	NC

3.11 Fast Ethernet Connector

The Fast Ethernet controller provides with 16-bit performance, ISA bus master capability, and full compliance with IEEE 802.3 10Base-T specifications.

For 10Base-T RJ-45 operation, please connect the network connection by plugging one end of the cable into the RJ-45 to CN13 Connector.

CN13 : Ethernet Connector

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	TX+	2	TX-
3	RX+	4	GND
5	GND	6	RX-
7	GND	8	GND

3.12 Flat-Panel Connector

The HS-4010 provides a 44-pin 2.0 mm pitch header connector (CN8) for Flat panel connection. The information here also provides some pin information samples to Panel Sharp LM64183P, LM64C35P & LM64C142 and NEC NL8060AC26 ,Sharp LQ64D34.

+12V	1	2	+12V
GND	3	4	GND
PV _{CC}	5	6	PV _{CC}
FPV _{ee}	7	8	GND
P ₀	9	10	P ₁
P ₂	11	12	P ₃
P ₄	13	14	P ₅
P ₆	15	16	P ₇
P ₈	17	18	P ₉
P ₁₀	19	20	P ₁₁
P ₁₂	21	22	P ₁₃
P ₁₄	23	24	P ₁₅
P ₁₆	25	26	P ₁₇
P ₁₈	27	28	P ₁₉
P ₂₀	29	30	P ₂₁
P ₂₂	31	32	P ₂₃
GND	33	34	GND
SHFCLK	35	36	FLM
M	37	38	LP
GND	39	40	ENABKL
GND	41	42	ASHFCLK
V _{CC}	43	44	V _{CC}

3.13 Connections for four standard LCDs

Connections to Sharp LM64183P

(640 x 480 DSTN MONO LCD)

Sharp LM64P83		HS-4010 CN10	
Pin	Pin name	Pin	Pin name
CN1-1	S	36	FLM
CN1-2	CP1	38	LP
CN1-3	CP2	35	SHFCLK
CN1-4	DISP	5	+5V
CN1-5	VDD	6	+5V
CN1-6	VSS	3	GND
CN1-7	VEE	-	-17 V (external power)
CN1-8	DU0	12	P3
CN1-9	DU1	11	P2
CN1-10	DU2	10	P1
CN1-11	DU3	9	P0
CN1-12	DL0	16	P7
CN1-13	DL1	15	P6
CN1-14	DL2	14	P5
CN1-15	DL3	13	P4

Connections to Sharp LM64C35P

(640 x 480 DSTN STN Color)

Sharp LM64C35P		HS-4010 CN10	
Pin	Pin name	Pin	Pin name
CN1-1	DL4	16	P7
CN1-2	Vss	3	GND
CN1-3	DL5	15	P6
CN1-4	YD	36	FLM
CN1-5	DL6	14	P5
CN1-6	LP	38	LP
CN1-7	DL7	13	P4
CN1-8	Vss	4	GND
CN1-9	Vss	8	GND
CN1-10	XCK	35	SLFCHK
CN1-11	DL0	24	P15
CN1-12	Vcon	-	Contrast Adjust
CN1-13	DL1	23	P14
CN1-14	Vdd	5	+5V
CN1-15	Vss	33	GND
CN1-16	Vdd	6	+5V
CN1-17	DL2	22	P13
CN1-18	DISP	6	+5V
CN1-19	DL3	21	P12
CN1-20	NC	-	-
CN1-21	Vss	34	GND
CN1-22	DU3	17	P8
CN1-23	DU4	12	P3
CN1-24	DU2	18	P9
CN1-25	DU5	11	P2
CN1-26	DU1	19	P10
CN1-27	Vss	39	GND
CN1-28	DU0	20	P11
CN1-29	DU6	10	P1
CN1-30	Vss	39	GND
CN1-31	DU7	9	P0

Connections to NEC NL8060AC26 (800 x 600 TFT Color)

NEC NL8060AC26		HS-4010 CN10	
Pin	Pin name	Pin	Pin name
CN1-1	GND	3	GND
CN1-2	Dot Clock	35	SHFCLK
CN1-3	GND	4	GND
CN1-4	Hsync	38	LP
CN1-5	Hsync	38	FLM
CN1-6	GND	8	GND
CN1-7	GND	8	GND
CN1-8	GND	8	GND
CN1-9	R0	27	P18
CN1-10	R1	28	P19
CN1-11	R2	29	P20
CN1-12	GND	8	GND
CN1-13	R3	30	P21
CN1-14	R4	31	P22
CN1-15	R5	32	P23
CN1-16	GND	39	GND
CN1-17	GND	39	GND
CN1-18	GND	39	GND
CN1-19	G0	19	P10
CN1-20	G1	20	P11
CN1-21	G2	21	P12
CN1-22	GND	39	GND
CN1-23	G3	22	P13
CN1-24	G4	23	P14
CN1-25	G5	24	P15
CN1-26	GND	41	GND
CN1-27	GND	41	GND
CN1-28	GND	41	GND
CN1-29	B0	11	P2
CN1-30	B1	12	P3
CN1-31	B2	13	P4
CN1-32	GND	41	GND
CN1-33	B3	14	P5
CN1-34	B4	15	P6
CN1-35	B5	16	P7
CN1-36	GND	41	GND
CN1-37	DE	37	M
CN1-38	PVcc	43	PVcc

CN1-39	PVcc	44	PVcc
CN1-40	PVcc	5	PVcc
CN1-41	MODE	-	---

Connections to Sharp LM64C142 (640 x 480 DSTN STN Color)

Sharp LM64C142		HS-4010 CN10	
Pin	Pin name	Pin	Pin name
CN1-1	YD	36	FLM
CN1-2	LP	38	LP
CN1-3	XCX	35	SHFCLK
CN1-4	DISP	5	+5V
CN1-5	PVdd	6	+5V
CN1-6	PVss	3	GND
CN1-7	PVee	-	+27 V (external power)
CN1-8	DU0	20	P11
CN1-9	DU1	19	P10
CN1-10	DU2	18	P9
CN1-11	DU3	17	P8
CN1-12	DU4	12	P3
CN1-13	DU5	11	P2
CN1-14	DU6	10	P1
CN1-15	DU7	9	P0
CN2-1	Vss	4	GND
CN2-2	DL0	24	P15
CN2-3	DL1	23	P14
CN2-4	DL2	22	P13
CN2-5	DL3	21	P12
CN2-6	DL4	16	P7
CN2-7	DL5	15	P6
CN2-8	DL6	14	P5
CN2-9	DL7	13	P4
CN2-10	Vss	8	GND

**Connections to Sharp LQ64D34
(640 x 480 TFT Color)**

Sharp LQ64D34		HS-4010 CN10	
Pin	Pin name	Pin	Pin name
CN1-1	GND	3	GND
CN1-2	CK	35	SHFCLK
CN1-3	HSYNC	38	LP
CN1-4	VSYNC	36	FLM
CN1-5	GND	4	GND
CN1-6	R0	27	P18
CN1-7	R1	28	P19
CN1-8	R2	29	P20
CN1-9	R3	30	P21
CN1-10	R4	31	P22
CN1-11	R5	32	P23
CN1-12	GND	33	GND
CN1-13	G0	19	P10
CN1-14	G1	20	P11
CN1-15	G2	21	P12
CN1-16	G3	22	P13
CN1-17	G4	23	P14
CN1-18	G5	24	P15
CN1-19	GND	34	GND
CN1-20	B0	11	P2
CN1-21	B1	12	P3
CN1-22	B2	13	P4
CN1-23	B3	14	P5
CN1-24	B4	15	P6
CN1-25	B5	16	P7
CN1-26	GND	39	GND
CN1-27	ENAB	37	DE
CN1-28	VCC	5	VCC
CN1-29	VCC	6	VCC
CN1-30	OAS	N.C	
CN1-31	N.C	N.C	

Chapter-4

AWARD BIOS Setup

For maintain the HS-4010's basic input/output system operating, the HS-4010 is now using AWARD BIOS for the system configuration and operation. The BIOS's setup program is designed to provide the maximum flexibility in configuring the system by offering various optional which allowing for select and meet all of the end-user requirements.

To access AWARD BIOS Setup program, press key when after Power-On-Reset memory test. The first show out prompt screen is the BIOS setup Main Menu.

User is now may select for Standard CMOS Setup, Advanced COMS Setup, Advanced Chipset Setup, Power Management Setup, PCI/PnP Setup, Peripheral Setup, Auto-Detect Hard Disks, Change User Password, Change Supervisor Password, Change Language Setting, Auto Configuration with Optional Settings and Auto Configuration with Fail Safe Settings. After any selecting or setting, please choice Save Settings and Exit or choice Exit Without Saving.

Any miss type in parameters of BIOS setup may cause a screen error display out. You may load again the default setting of the BIOS by press End key and power-on.

4.1 Main Menu

Once when you enter the AWARD BIOS CMOS Setup Utility, the first prompt out screen is the BIOS's Main Menu. From the Main Menu, the BIOS allow you to select from several setup functions and two exit choices. Use the arrow keys to select the demand items and press <Enter> to accept and enter its sub-menu. Press Esc key if abandoned the selection item.

ROM PCI/ISA BIOS (xxxxxxx)

CMOS SETUP UTILITY

AWARD SOFTWARE, INC.

STANDARD CMOS SETUP	INTEGRATED PERIPHERALS
BIOS FEATURES SETUP	SUPERVISOR PASSWORD
CHIPSET FEATURES SETUP	USER PASSWORD
POWER MANGEMENT SETUP	IDE HDD AUTO DETECTION
PCI CONFIGURATION SETUP	HDD LOW LEVEL FORMAT
LOAD BIOS DEFAULTS	SAVE & EXIT SETUP
LOAD SETUP DEFAULTS	EXIT WITHOUT SAVING
Esc : Quit	DEL : Select Item
F10 : Save & Exit	(Shift)F2 : Change Color

4.2 Standard CMOS Setup

The Standard Setup is used for the basic hardware system configuration. The main function is for Data/Time and Floppy/Hard Disk Drive settings. Please refer to the following screen for this setup. When the IDE hard disk drive you are using is larger than 528MB, please set the HDD mode to **LBA** mode. Please use the IDE Setup Utility in BIOS SETUP to install the HDD correctly.

Standard CMOS Setup

Data (mm:dd:yy) : Fri, Dec 19 1998								
Time (hh:mm:ss) : 00:00:00								
			CYLS	HEAD	PRECOMP	LANDZ	SECTOR	MODE
Driver C :AUTO (0Mb)	0	0	0	0	0	0	Auto
Driver D :AUTO (0Mb)	0	0	0	0	0	0	Auto
Drive A : 1.44M , 3.5in.								
Drive B : None								
Floppy 3 Mode Support : Disabled								
LCD&CRT: AUTO								
Halt On : All Errors								
			Base Memory : 640K					
			Extended Memory : 15360K					
			Other Memory : 384K					
			Total Memory : 16384K					
ESC : Quit			←←←← : Select Item			PU/PD/ + / - : Modify		
F1 : Help			(Shift) F2: Change Color					

4.3 BIOS Features Setup

This advanced setup is designed for the customers to achieve the highest performance of the HS-4010 board. As for normal operations, customers don't have to change any default settings. The default setting is pre-set for most reliable operations. Please refer to the following screen for the Advanced Setup.

BIOS FEATURES Setup

Virus Protection	: Disabled	Video BIOS	Shadow	: Enabled
CPU Internal Cache	: Enabled	C8000-CFFFF	Shadow	: Disabled
External Cache	: Enabled	D0000-D7FFF	Shadow	: Disabled
Quick Power On Self Test	: Disabled	D8000-DFFFF	Shadow	: Disabled
Boot Sequence	: C,A,SCSI			
Swap Floppy Drive	: Disabled			
Boot Up NumLock Status	: On			
Boot Up System Speed	: High			
Gate A20 Option	: Fast			
Memory Parity Check	: Disabled			
Typematic Rate Setting	: Disabled			
Typematic Rate (Chars/Sec)	: 6			
Typematic Delay (Msec)	: 250			
Security Option	: Setup			
PCI/VGA Palette Snoop	: Disabled			
OS Select For DRAM > 64MB	: Non-OS2			
		ESC	: Quit	<i>Esc Esc Esc</i> : Select Item
		F1	: Help	PU/PD/+/-: Modify
		F5	: Old Values (Shift) F2	: Color
		G6	: Load BIOS Defaults	
		G7	: Load Setup Defaults	

4.4 Chipset Features Setup

The section allow you to configure the system based on the specific feature of the installed chipset. This chipset manages bus speeds and the access to the system memory resources, such as DRAM and external cache. It also coordinates the communications between the conventional ISA and PCI buses. It must be stated that these items should never be altered. The default setting have been chosen because they provide the best operating conditions for your system. You might consider and make any changes only if you discover that the data has been lost while using your system.

Chipset Features Setup

Auto Configuration	: Enable	
At-Bus Clock	: CLK/4	
DRAM Read Timing	: Normal	
DRAM Write Timing	: Normal	
SRAM Read Timing	: 2- 1- 1- 1	
SRAM Write Timing	: 0 Wait	
Hidden Refresh	: Disabled	
Memory Hole (15-16M)	: Disabled	
ISA I/O Recovery	: Enable	
Fast- back- to Back	: Enable	
		ESC : Quit Left / Right : Select Item
		F1 : Help PU/PD/+/=: Modify
		F5 : Old Values (Shift) F2 : Color
		F6 : Load BIOS Defaults
		F7 : Load Setup Defaults

4.5 Power Management Setup

The Power Management Setup allows user to configure the system for save energy in a most effective way while operating in a manner consistent with his own style of computer use.

Power Management Setup

Power Management	: Disabled	IRQ5 (LPT2)	: ON
PM Control by APM	: Yes	IRQ6 (Floppy Disk)	: ON
Video Off Option	: Susp,Stby ->Off	IRQ7 (LPT1)	: ON
Video Off Method	: V/H Sync Black	IRQ8 (RTC Alarm)	: OFF
MODEM Use IRQ	: 3	IRQ9 (IRQ2 Redir)	: ON
** PM Timers **		IRQ10 (Reserved)	: OFF
HDD Power Down	: Disabled	IRQ11 (Reserved)	: OFF
Doze Mode	: Disabled	IRQ12 (PS/2 Mouse)	: ON
Standby mode	: Disabled	IRQ13 (Coprocessor)	: OFF
Suspend Mode	: Disabled	IRQ14 (Hard Disk)	: ON
** PM Ecents **		IRQ15 (Reserved)	: OFF
VGA	: OFF		
FDD (3FXh)	: ON		
LPT & COM	: LPT/COM		
HDD & FDD	: ON	ESC : Quit	⏏⏏⏏⏏: Select Item
NMI	: OFF	F1 : Help	PU/PD/+/-: Modify
IRQ3(COM2)	: ON	F5 : Old Values	(Shift) F2 : Color
IRQ4(COM1)	: ON	F6 : Load BIOS Defaults	
		F7 : Load Setup Defaults	

4.6 PnP/PCI Configuration Setup

In this section, the PnP/PCI configuration setup allows you to configure the ISA and PCI devices installed in your system by manually or auto.

PnP BIOS Auto- configuration	: Disabled	CPU to PCI Write Buffer	: Enabled
		CPU to PCI Byte Merge	: Enabled
		PCI to DRAM Buffer	: Enabled
1st Available IRQ	: 10		
2nd Available IRQ	: 11		
3rd Available IRQ	: 12		
4th Available IRQ	: 9		
PCI IRQ Activated by	: Level		
PCI IDE IRQ Map to	: PCI-AUTO		
Primary IDE INT#	: A		
Secondary IDE INT#	: B		
		ESC : Quit	###: Select Item
		F1 : Help	PU/PD/+-: Modify
		F5 : Old Values	(Shift) F2 : Color
		F6 : Load BIOS Defaults	
		F7 : Load Setup Defaults	

4.7 Integrated Peripheral Setup

For completed all input and output devices (i.e. FDD Drivers, IDE Drivers, Serial Ports, IR and Parallel Port), please refer to the following example.

Integrated Peripherals Setup

OnChip IDE LocalBus IDE	: Enabled	
IDE Buffer for Dos & Win	: Enabled	
The 2nd Channel IDE	: Enabled	
IDE HDD Block Mode	: Enabled	
IDE Primary Master PIO	: Auto	
IDE Primary Slave PIO	: Auto	
IDE Secondary Master PIO	: Auto	
IDE Secondary Slave PIO	: Auto	
Onboard FDD Controller	: Enabled	
Onboard UART1	: 3F8/IRQ4	
Onboard UART2	: 2F8/IRQ3	
Onboard Parallel Port	: 378/IRQ7	
Onboard Parallel Mode	: Normal	
LCD Panel Type	: Panel 5	
		ESC : Quit : Select Item
		F1 : Help PU/PD/+/-: Modify
		F5 : Old Values (Shift) F2 : Color
		F6 : Load BIOS Defaults
		F7 : Load Setup Defaults

4.8 Panel Type Select

User can select the different type of LCD panel by change the value of “LCD Panel Type“ under the integrated peripherals setup.

The default setting is “Panel 5” , according with different usage, user might change the value from 1 to 70, as list as the above table.

Default BIOS Panel Types

No	Resolution	Data
0	1024x768	Dual Scan STN Color
1	1280x1024	TFT Color
2	640x480	Dual Scan STN Color
3	800x600	Dual Scan STN Color
4	640x480	Sharp TFT Color
*5	640x480	18-bit TFT Color
6	1024x768	TFT Color
7	800x600	TFT Color

*) : default setting

Chapter-5

A Brief Browse of 10 base-T LAN RTL-8019's Installation Software

The Boser HS-4010 provides an on board 16-bit ISA 10 base-T Ethernet LAN interface RJ-45 connection for easy using the HS-4010 486 Little All-in-one L/VGA Industrial Single Board in connection to-with Novell NE2000 compatible LAN network system.

The HS-4010' s design which is basing on RTL 8019 chipset with provides an RJ-45 10 base-T NE2000 compatible interface. We here provide some information on the installation for your first reference.

The delivery of the software packages with HS-4010 which including a easy access help manual by files from. The version of this help manual is 1.00 on dated Jun.19.1997. Please read all following help manual first before your installation of this LAN system.

For completed information, please browse at
<http://www.realtek.com.tw>

If you want to select I/O must be Run "rset8019.exe" to configure and test the adapter, and set the Operating Mode as follow:
set "Operating Mode" to "Jumperless" and set the proper IRQ and I/O.
(Write down the IRQ and I/O address for later use)
set "Operating Mode" to "Plug & Play", and reboot the system. (Run rset8019.exe again, and write down the IRQ and I/O address for later use)
Startup the Solaris and log on to Solaris as Superuser(root).